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Analysis Report

ANALYTICAL RESULTS

Prepared by:

Eurofins Lancaster Laboratories Environmental
2425 New Holland Pike
Lancaster, PA 17601

Prepared for:

Stantec
1060 Andrew Drive
Suite 140
West Chester PA 19380

Report Date: November 07, 2016

Project: Tank 8 Investigation

Submittal Date: 10/14/2016
Group Number: 1720858
PO Number: MARCUS HOOK
State of Sample Origin: PA

Client Sample Description	Lancaster Labs (LL) #
MH8-30(1.5-2.0) Grab Soil	8642787
MH8-31(1.5-2.0) Grab Soil	8642788
Trip Blank Water	8642789

The specific methodologies used in obtaining the enclosed analytical results are indicated on the Laboratory Sample Analysis Record.

Regulatory agencies do not accredit laboratories for all methods, analytes, and matrices. Our current scopes of accreditation can be viewed at http://www.eurofinsus.com/environment-testing/laboratories/eurofins-lancaster-laboratories-environmental/resources/certifications/ . To request copies of prior scopes of accreditation, contact your project manager.

Electronic Copy To	Stantec	Attn: Mark Schaeffer
Electronic Copy To	Stantec	Attn: Andrew Bradley
Electronic Copy To	Sunoco c/o Stantec	Attn: Jennifer Menges

Respectfully Submitted,

Amek Carter
Specialist

(717) 556-7252

Sample Description: MH8-30(1.5-2.0) Grab Soil

Project Name: Tank 8 Investigation

LL Sample # SW 8642787
LL Group # 1720858
Account # 16657

Collected: 10/14/2016 08:50 by DH

Submitted: 10/14/2016 18:35
Reported: 11/07/2016 11:20

Stantec
1060 Andrew Drive
Suite 140
West Chester PA 19380

MH830

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**mg/kg**		**mg/kg**	
10237	Benzene	71-43-2	0.77	J	0.10	174.12
10237	sec-Butylbenzene	135-98-8	1.5		0.20	174.12
10237	tert-Butylbenzene	98-06-6	0.36	J	0.20	174.12
10237	Cyclohexane	110-82-7	45		0.20	174.12
10237	1,2-Dichloroethane	107-06-2	N.D.		0.20	174.12
10237	Ethylbenzene	100-41-4	N.D.		0.20	174.12
10237	n-Hexane	110-54-3	1.4		0.20	174.12
10237	Isopropylbenzene	98-82-8	3.5		0.20	174.12
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.10	174.12
10237	Naphthalene	91-20-3	N.D.		0.20	174.12
10237	Toluene	108-88-3	0.22	J	0.20	174.12
10237	1,2,4-Trimethylbenzene	95-63-6	0.57	J	0.20	174.12
10237	1,3,5-Trimethylbenzene	108-67-8	1.1		0.20	174.12
10237	Xylene (Total)	1330-20-7	2.7		0.20	174.12
GC/MS Semivolatiles	**SW-846 8270C**		**mg/kg**		**mg/kg**	
10728	Acenaphthene	83-32-9	0.65		0.019	5
10728	Anthracene	120-12-7	0.57		0.019	5
10728	Benzo(a)anthracene	56-55-3	0.59		0.019	5
10728	Benzo(a)pyrene	50-32-8	0.39		0.019	5
10728	Benzo(b)fluoranthene	205-99-2	0.21		0.019	5
10728	Benzo(g,h,i)perylene	191-24-2	0.70		0.019	5
10728	Benzo(k)fluoranthene	207-08-9	0.036	J	0.019	5
10728	1,1'-Biphenyl	92-52-4	N.D.		0.096	5
10728	Di-n-butylphthalate	84-74-2	N.D.		0.38	5
10728	Chrysene	218-01-9	1.2		0.019	5
10728	Dibenz(a,h)anthracene	53-70-3	N.D.		0.019	5
10728	Diethylphthalate	84-66-2	N.D.		0.38	5
10728	2,4-Dimethylphenol	105-67-9	N.D.		0.096	5
10728	2,4-Dinitrophenol	51-28-5	N.D.		1.7	5
10728	bis(2-Ethylhexyl)phthalate	117-81-7	0.95	J	0.38	5
10728	Fluoranthene	206-44-0	0.29		0.019	5
10728	Fluorene	86-73-7	1.1		0.019	5
10728	Indeno(1,2,3-cd)pyrene	193-39-5	N.D.		0.019	5
10728	2-Methylnaphthalene	91-57-6	12		0.019	5
10728	2-Methylphenol	95-48-7	N.D.		0.096	5
10728	4-Methylphenol	106-44-5	N.D.		0.096	5
	3-Methylphenol and 4-methylphenol cannot be resolved under the chromatographic conditions used for sample analysis. The result reported for 4-methylphenol represents the combined total of both compounds.					
10728	4-Nitrophenol	100-02-7	N.D.		0.96	5
10728	Phenanthrene	85-01-8	3.1		0.019	5
10728	Phenol	108-95-2	N.D.		0.096	5
10728	Pyrene	129-00-0	1.3		0.019	5
10728	Pyridine	110-86-1	N.D.		0.38	5
10728	Quinoline	91-22-5	N.D.		0.19	5
Volatiles by Extraction	**SW-846 8011**		**mg/kg**		**mg/kg**	
13214	Ethylene dibromide	106-93-4	N.D.		0.00023	1

Sample Description: MH8-30(1.5-2.0) Grab Soil

Project Name: Tank 8 Investigation

LL Sample # SW 8642787
LL Group # 1720858
Account # 16657

Collected: 10/14/2016 08:50 by DH

Submitted: 10/14/2016 18:35
Reported: 11/07/2016 11:20

Stantec
1060 Andrew Drive
Suite 140
West Chester PA 19380

MH830

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.				
Metals		**SW-846 6010B**	**mg/kg**	**mg/kg**	
06952	Cobalt	7440-48-4	6.63	0.131	1
06955	Lead	7439-92-1	11.2	0.600	1
06961	Nickel	7440-02-0	14.1	0.327	1
06971	Vanadium	7440-62-2	30.8	0.153	1
06972	Zinc	7440-66-6	60.2	0.742	1
Wet Chemistry		**SM 2540 G-1997**	**%**	**%**	
00111	Moisture	n.a.	14.3	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.				

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	Evergreen Comprehensive VOCs	SW-846 8260B	1	Q162941AA	10/20/2016 16:47	Jennifer K Howe	174.12
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201628942996	10/14/2016 08:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201628942996	10/14/2016 08:50	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201628942996	10/14/2016 08:50	Client Supplied	1
10728	Skinner 8270 (microwave)	SW-846 8270C	1	16294SLB026	10/21/2016 14:57	Linda M Hartenstine	5
10812	BNA Soil Microwave Skinner	SW-846 3546	1	16294SLB026	10/20/2016 16:00	Shawn J McMullen	1
13214	EPA 8011 Solids	SW-846 8011	1	162940002A	10/31/2016 21:36	Heather M Miller	1
13218	EDB Soil Extraction	SW-846 8011	1	162940002A	10/20/2016 17:40	Shawn J McMullen	1
06952	Cobalt	SW-846 6010B	1	162925708005	10/24/2016 08:34	Joanne M Gates	1
06955	Lead	SW-846 6010B	1	162925708005	10/24/2016 08:34	Joanne M Gates	1
06961	Nickel	SW-846 6010B	1	162925708005	10/24/2016 08:34	Joanne M Gates	1
06971	Vanadium	SW-846 6010B	1	162925708005	10/24/2016 08:34	Joanne M Gates	1
06972	Zinc	SW-846 6010B	1	162925708005	10/24/2016 08:34	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	162925708005	10/23/2016 21:12	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16293820007B	10/19/2016 15:26	Larry E Bevins	1

Sample Description: MH8-31(1.5-2.0) Grab Soil

Project Name: Tank 8 Investigation

LL Sample # SW 8642788
LL Group # 1720858
Account # 16657

Collected: 10/14/2016 09:20 by DH

Submitted: 10/14/2016 18:35
Reported: 11/07/2016 11:20

Stantec
1060 Andrew Drive
Suite 140
West Chester PA 19380

MH831

CAT No.	Analysis Name	CAS Number	Dry Result		Dry Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**mg/kg**		**mg/kg**	
10237	Benzene	71-43-2	0.62	J	0.12	208.3
10237	sec-Butylbenzene	135-98-8	12		0.24	208.3
10237	tert-Butylbenzene	98-06-6	1.3		0.24	208.3
10237	Cyclohexane	110-82-7	N.D.		0.24	208.3
10237	1,2-Dichloroethane	107-06-2	N.D.		0.24	208.3
10237	Ethylbenzene	100-41-4	3.6		0.24	208.3
10237	n-Hexane	110-54-3	9.3		0.24	208.3
10237	Isopropylbenzene	98-82-8	21		0.24	208.3
10237	Methyl Tertiary Butyl Ether	1634-04-4	N.D.		0.12	208.3
10237	Naphthalene	91-20-3	N.D.		0.24	208.3
10237	Toluene	108-88-3	1.3		0.24	208.3
10237	1,2,4-Trimethylbenzene	95-63-6	0.34	J	0.24	208.3
10237	1,3,5-Trimethylbenzene	108-67-8	3.5		0.24	208.3
10237	Xylene (Total)	1330-20-7	2.6		0.24	208.3
GC/MS Semivolatiles	**SW-846 8270C**		**mg/kg**		**mg/kg**	
10728	Acenaphthene	83-32-9	3.0		0.037	5
10728	Anthracene	120-12-7	3.1		0.037	5
10728	Benzo(a)anthracene	56-55-3	2.4		0.037	5
10728	Benzo(a)pyrene	50-32-8	1.2		0.037	5
10728	Benzo(b)fluoranthene	205-99-2	0.61		0.037	5
10728	Benzo(g,h,i)perylene	191-24-2	1.0		0.037	5
10728	Benzo(k)fluoranthene	207-08-9	0.25		0.037	5
10728	1,1'-Biphenyl	92-52-4	N.D.		0.19	5
10728	Di-n-butylphthalate	84-74-2	N.D.		0.74	5
10728	Chrysene	218-01-9	3.9		0.037	5
10728	Dibenz(a,h)anthracene	53-70-3	N.D.		0.037	5
10728	Diethylphthalate	84-66-2	N.D.		0.74	5
10728	2,4-Dimethylphenol	105-67-9	N.D.		0.19	5
10728	2,4-Dinitrophenol	51-28-5	N.D.		3.3	5
10728	bis(2-Ethylhexyl)phthalate	117-81-7	N.D.		0.74	5
10728	Fluoranthene	206-44-0	1.5		0.037	5
10728	Fluorene	86-73-7	6.2		0.037	5
10728	Indeno(1,2,3-cd)pyrene	193-39-5	0.29		0.037	5
10728	2-Methylnaphthalene	91-57-6	62		0.19	50
10728	2-Methylphenol	95-48-7	N.D.		0.19	5
10728	4-Methylphenol	106-44-5	N.D.		0.19	5
	3-Methylphenol and 4-methylphenol cannot be resolved under the chromatographic conditions used for sample analysis. The result reported for 4-methylphenol represents the combined total of both compounds.					
10728	4-Nitrophenol	100-02-7	N.D.		1.9	5
10728	Phenanthrene	85-01-8	19		0.037	5
10728	Phenol	108-95-2	N.D.		0.19	5
10728	Pyrene	129-00-0	4.3		0.037	5
10728	Pyridine	110-86-1	N.D.		0.74	5
10728	Quinoline	91-22-5	N.D.		0.37	5
	Reporting limits were raised due to interference from the sample matrix.					
Volatiles by Extraction	**SW-846 8011**		**mg/kg**		**mg/kg**	

Sample Description: MH8-31(1.5-2.0) Grab Soil

Project Name: Tank 8 Investigation

LL Sample # SW 8642788
LL Group # 1720858
Account # 16657

Collected: 10/14/2016 09:20 by DH

Submitted: 10/14/2016 18:35
Reported: 11/07/2016 11:20

Stantec
1060 Andrew Drive
Suite 140
West Chester PA 19380

MH831

CAT No.	Analysis Name	CAS Number	Dry Result	Dry Method Detection Limit	Dilution Factor
Volatiles by Extraction	**SW-846 8011**		**mg/kg**	**mg/kg**	
13214	Ethylene dibromide	106-93-4	N.D.	0.00022	1
	The recovery for a target analyte(s) in the Laboratory Control Spike(s) is outside the QC acceptance limits as noted on the QC Summary.				
Metals	**SW-846 6010B**		**mg/kg**	**mg/kg**	
06952	Cobalt	7440-48-4	7.18	0.105	1
06955	Lead	7439-92-1	14.3	0.482	1
06961	Nickel	7440-02-0	12.5	0.263	1
06971	Vanadium	7440-62-2	22.8	0.123	1
06972	Zinc	7440-66-6	27.0	0.596	1
Wet Chemistry	**SM 2540 G-1997**		**%**	**%**	
00111	Moisture	n.a.	11.6	0.50	1
	Moisture represents the loss in weight of the sample after oven drying at 103 - 105 degrees Celsius. The moisture result reported is on an as-received basis.				

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10237	Evergreen Comprehensive VOCs	SW-846 8260B	1	Q162941AA	10/20/2016 17:10	Jennifer K Howe	208.3
07579	GC/MS-5g Field Preserv.MeOH-NC	SW-846 5035A	1	201628942996	10/14/2016 09:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	1	201628942996	10/14/2016 09:20	Client Supplied	1
02392	L/H Field Preserved Bisulfate	SW-846 5035A	2	201628942996	10/14/2016 09:20	Client Supplied	1
10728	Skinner 8270 (microwave)	SW-846 8270C	1	16294SLB026	10/21/2016 16:38	Linda M Hartenstine	5
10728	Skinner 8270 (microwave)	SW-846 8270C	1	16294SLB026	10/21/2016 17:12	Linda M Hartenstine	50
10812	BNA Soil Microwave Skinner	SW-846 3546	1	16294SLB026	10/20/2016 16:00	Shawn J McMullen	1
13214	EPA 8011 Solids	SW-846 8011	1	162940002A	10/31/2016 22:24	Heather M Miller	1
13218	EDB Soil Extraction	SW-846 8011	1	162940002A	10/20/2016 17:40	Shawn J McMullen	1
06952	Cobalt	SW-846 6010B	1	162925708005	10/24/2016 08:38	Joanne M Gates	1
06955	Lead	SW-846 6010B	1	162925708005	10/24/2016 08:38	Joanne M Gates	1
06961	Nickel	SW-846 6010B	1	162925708005	10/24/2016 08:38	Joanne M Gates	1

Sample Description: MH8-31(1.5-2.0) Grab Soil

Project Name: Tank 8 Investigation

LL Sample # SW 8642788
LL Group # 1720858
Account # 16657

Collected: 10/14/2016 09:20 by DH

Submitted: 10/14/2016 18:35
Reported: 11/07/2016 11:20

Stantec
1060 Andrew Drive
Suite 140
West Chester PA 19380

MH831

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
06971	Vanadium	SW-846 6010B	1	162925708005	10/24/2016 08:38	Joanne M Gates	1
06972	Zinc	SW-846 6010B	1	162925708005	10/24/2016 08:38	Joanne M Gates	1
05708	ICP-ICPMS - SW, 3050B - U3	SW-846 3050B	1	162925708005	10/23/2016 21:12	Annamaria Kuhns	1
00111	Moisture	SM 2540 G-1997	1	16293820007B	10/19/2016 15:26	Larry E Bevins	1

Sample Description: Trip Blank Water

Project Name: Tank 8 Investigation

LL Sample # WW 8642789
LL Group # 1720858
Account # 16657

Collected: 10/06/2016

Submitted: 10/14/2016 18:35
Reported: 11/07/2016 11:20

Stantec
1060 Andrew Drive
Suite 140
West Chester PA 19380

MH8TB

CAT No.	Analysis Name	CAS Number	Result	Method Detection Limit	Dilution Factor
GC/MS Volatiles	**SW-846 8260B**		**ug/l**	**ug/l**	
10335	Benzene	71-43-2	N.D.	0.5	1
10335	sec-Butylbenzene	135-98-8	N.D.	1	1
10335	tert-Butylbenzene	98-06-6	N.D.	1	1
10335	Cyclohexane	110-82-7	N.D.	2	1
10335	1,2-Dibromoethane	106-93-4	N.D.	0.5	1
10335	1,2-Dichloroethane	107-06-2	N.D.	0.5	1
10335	Ethylbenzene	100-41-4	N.D.	0.5	1
10335	n-Hexane	110-54-3	N.D.	2	1
10335	Isopropylbenzene	98-82-8	N.D.	1	1
10335	Methyl Tertiary Butyl Ether	1634-04-4	N.D.	0.5	1
10335	Naphthalene	91-20-3	N.D.	1	1
10335	Toluene	108-88-3	N.D.	0.5	1
10335	1,2,4-Trimethylbenzene	95-63-6	N.D.	1	1
10335	1,3,5-Trimethylbenzene	108-67-8	N.D.	1	1
10335	Xylene (Total)	1330-20-7	N.D.	0.5	1

Sample Comments

PA DEP Lab Certification ID 36-00037, Expiration Date: 1/31/17.

All QC is compliant unless otherwise noted. Please refer to the Quality Control Summary for overall QC performance data and associated samples.

Laboratory Sample Analysis Record

CAT No.	Analysis Name	Method	Trial#	Batch#	Analysis Date and Time	Analyst	Dilution Factor
10335	Evergreen Comprehensive VOCs	SW-846 8260B	1	N162931AA	10/19/2016 12:53	Daniel H Heller	1
01163	GC/MS VOA Water Prep	SW-846 5030B	1	N162931AA	10/19/2016 12:53	Daniel H Heller	1

Quality Control Summary

Client Name: Stantec
Reported: 11/07/2016 11:20

Group Number: 1720858

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD was performed, unless otherwise specified in the method.

All Inorganic Initial Calibration and Continuing Calibration Blanks met acceptable method criteria unless otherwise noted on the Analysis Report.

Method Blank

Analysis Name	Result	MDL
	mg/kg	mg/kg
Batch number: Q162941AA	Sample number(s): 8642787-8642788	
Benzene	N.D.	0.025
sec-Butylbenzene	N.D.	0.050
tert-Butylbenzene	N.D.	0.050
Cyclohexane	N.D.	0.050
1,2-Dichloroethane	N.D.	0.050
Ethylbenzene	N.D.	0.050
n-Hexane	N.D.	0.050
Isopropylbenzene	N.D.	0.050
Methyl Tertiary Butyl Ether	N.D.	0.025
Naphthalene	N.D.	0.050
Toluene	N.D.	0.050
1,2,4-Trimethylbenzene	N.D.	0.050
1,3,5-Trimethylbenzene	N.D.	0.050
Xylene (Total)	N.D.	0.050
	ug/l	ug/l
Batch number: N162931AA	Sample number(s): 8642789	
Benzene	N.D.	0.5
sec-Butylbenzene	N.D.	1
tert-Butylbenzene	N.D.	1
Cyclohexane	N.D.	2
1,2-Dibromoethane	N.D.	0.5
1,2-Dichloroethane	N.D.	0.5
Ethylbenzene	N.D.	0.5
n-Hexane	N.D.	2
Isopropylbenzene	N.D.	1
Methyl Tertiary Butyl Ether	N.D.	0.5
Naphthalene	N.D.	1
Toluene	N.D.	0.5
1,2,4-Trimethylbenzene	N.D.	1
1,3,5-Trimethylbenzene	N.D.	1
Xylene (Total)	N.D.	0.5
	mg/kg	mg/kg
Batch number: 16294SLB026	Sample number(s): 8642787-8642788	
Acenaphthene	N.D.	0.0033
Anthracene	N.D.	0.0033
Benzo(a)anthracene	N.D.	0.0033
Benzo(a)pyrene	N.D.	0.0033
Benzo(b)fluoranthene	N.D.	0.0033
Benzo(g,h,i)perylene	N.D.	0.0033

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Stantec
Reported: 11/07/2016 11:20

Group Number: 1720858

Method Blank (continued)

Analysis Name	Result mg/kg	MDL mg/kg
Benzo(k)fluoranthene	N.D.	0.0033
1,1'-Biphenyl	N.D.	0.017
Di-n-butylphthalate	N.D.	0.067
Chrysene	N.D.	0.0033
Dibenz(a,h)anthracene	N.D.	0.0033
Diethylphthalate	N.D.	0.067
2,4-Dimethylphenol	N.D.	0.017
2,4-Dinitrophenol	N.D.	0.30
bis(2-Ethylhexyl)phthalate	N.D.	0.067
Fluoranthene	N.D.	0.0033
Fluorene	N.D.	0.0033
Indeno(1,2,3-cd)pyrene	N.D.	0.0033
2-Methylnaphthalene	N.D.	0.0033
2-Methylphenol	N.D.	0.017
4-Methylphenol	N.D.	0.017
4-Nitrophenol	N.D.	0.17
Phenanthrene	N.D.	0.0033
Phenol	N.D.	0.017
Pyrene	N.D.	0.0033
Pyridine	N.D.	0.067
Quinoline	N.D.	0.033
Batch number: 162940002A	Sample number(s): 8642787-8642788	
Ethylene dibromide	N.D.	0.00020
Batch number: 162925708005	Sample number(s): 8642787-8642788	
Cobalt	N.D.	0.120
Lead	N.D.	0.550
Nickel	N.D.	0.300
Vanadium	N.D.	0.140
Zinc	N.D.	0.680

LCS/LCSD

Analysis Name	LCS Spike Added mg/kg	LCS Conc mg/kg	LCSD Spike Added mg/kg	LCSD Conc mg/kg	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
Batch number: Q162941AA	Sample number(s): 8642787-8642788								
Benzene	1.00	1.04	1.00	0.991	104	99	80-120	5	30
sec-Butylbenzene	1.00	1.12	1.00	1.04	112	104	69-120	8	30
tert-Butylbenzene	1.00	1.00	1.00	0.999	100	100	68-120	0	30
Cyclohexane	1.00	1.02	1.00	1.05	102	105	58-120	3	30
1,2-Dichloroethane	1.00	1.12	1.00	1.08	112	108	70-133	4	30
Ethylbenzene	1.00	0.981	1.00	0.965	98	97	80-120	2	30
n-Hexane	1.00	0.958	1.00	0.925	96	92	51-141	4	30
Isopropylbenzene	1.00	1.00	1.00	0.992	100	99	76-120	1	30

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Stantec
Reported: 11/07/2016 11:20

Group Number: 1720858

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	mg/kg	mg/kg	mg/kg	mg/kg					
Methyl Tertiary Butyl Ether	1.00	1.08	1.00	1.04	108	104	72-120	4	30
Naphthalene	1.00	1.01	1.00	0.958	101	96	53-120	5	30
Toluene	1.00	0.983	1.00	1.02	98	102	80-120	4	30
1,2,4-Trimethylbenzene	1.00	1.06	1.00	1.08	106	108	74-120	2	30
1,3,5-Trimethylbenzene	1.00	1.05	1.00	1.04	105	104	73-120	1	30
Xylene (Total)	3.00	2.97	3.00	2.90	99	97	80-120	2	30
	ug/l	ug/l	ug/l	ug/l					
Batch number: N162931AA	Sample number(s): 8642789								
Benzene	20	21.9			109		78-120		
sec-Butylbenzene	20	21.09			105		77-120		
tert-Butylbenzene	20	19.96			100		74-121		
Cyclohexane	20	20.19			101		65-131		
1,2-Dibromoethane	20	21.1			106		80-120		
1,2-Dichloroethane	20	19.38			97		66-128		
Ethylbenzene	20	22.42			112		78-120		
n-Hexane	20	21.48			107		62-144		
Isopropylbenzene	20	20.73			104		80-120		
Methyl Tertiary Butyl Ether	20	19.34			97		75-120		
Naphthalene	20	17.97			90		59-120		
Toluene	20	20.72			104		80-120		
1,2,4-Trimethylbenzene	20	21.14			106		75-120		
1,3,5-Trimethylbenzene	20	21.16			106		75-120		
Xylene (Total)	60	66.88			111		80-120		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 16294SLB026	Sample number(s): 8642787-8642788								
Acenaphthene	1.67	1.67			100		83-116		
Anthracene	1.67	1.65			99		82-118		
Benzo(a)anthracene	1.67	1.71			103		76-119		
Benzo(a)pyrene	1.67	1.68			101		85-117		
Benzo(b)fluoranthene	1.67	1.62			97		79-121		
Benzo(g,h,i)perylene	1.67	1.72			103		71-123		
Benzo(k)fluoranthene	1.67	1.63			98		79-120		
1,1'-Biphenyl	1.67	1.58			95		78-106		
Di-n-butylphthalate	1.67	1.65			99		84-120		
Chrysene	1.67	1.59			95		80-121		
Dibenz(a,h)anthracene	1.67	1.78			107		81-123		
Diethylphthalate	1.67	1.62			97		81-118		
2,4-Dimethylphenol	1.67	1.31			79		73-117		
2,4-Dinitrophenol	3.33	2.56			77		16-132		
bis(2-Ethylhexyl)phthalate	1.67	1.67			100		81-121		
Fluoranthene	1.67	1.65			99		81-117		
Fluorene	1.67	1.66			99		86-118		
Indeno(1,2,3-cd)pyrene	1.67	1.71			103		75-118		
2-Methylnaphthalene	1.67	1.61			97		83-109		
2-Methylphenol	1.67	1.66			99		80-133		

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Stantec
Reported: 11/07/2016 11:20

Group Number: 1720858

LCS/LCSD (continued)

Analysis Name	LCS Spike Added	LCS Conc	LCSD Spike Added	LCSD Conc	LCS %REC	LCSD %REC	LCS/LCSD Limits	RPD	RPD Max
	mg/kg	mg/kg	mg/kg	mg/kg					
4-Methylphenol	1.67	1.63			98		73-125		
4-Nitrophenol	1.67	1.41			85		52-133		
Phenanthrene	1.67	1.57			94		80-120		
Phenol	1.67	1.61			97		73-122		
Pyrene	1.67	1.54			93		80-120		
Pyridine	1.67	1.05			63		55-109		
Quinoline	1.67	1.61			97		80-119		
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 162940002A	Sample number(s): 8642787-8642788								
Ethylene dibromide	0.00450	0.00237	0.00450	0.00249	53*	55*	60-140	5	20
	mg/kg	mg/kg	mg/kg	mg/kg					
Batch number: 162925708005	Sample number(s): 8642787-8642788								
Cobalt	50	52.45			105		80-120		
Lead	15	15.63			104		80-120		
Nickel	50	53.51			107		80-120		
Vanadium	50	52.9			106		80-120		
Zinc	50	52.51			105		80-120		
	%	%	%	%					
Batch number: 16293820007B	Sample number(s): 8642787-8642788								
Moisture	89.5	89.45			100		99-101		

MS/MSD

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc	MS Spike Added	MS Conc	MSD Spike Added	MSD Conc	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
	ug/l	ug/l	ug/l	ug/l	ug/l					
Batch number: N162931AA	Sample number(s): 8642789 UNSPK: P640564									
Benzene	N.D.	20	22.87	20	22.93	114	115	78-120	0	30
sec-Butylbenzene	N.D.	20	22.34	20	22.89	112	114	77-120	2	30
tert-Butylbenzene	N.D.	20	21.45	20	21.8	107	109	74-121	2	30
Cyclohexane	N.D.	20	21.62	20	22.18	108	111	65-131	3	30
1,2-Dibromoethane	N.D.	20	20.48	20	20.84	102	104	80-120	2	30
1,2-Dichloroethane	N.D.	20	20.71	20	20.71	104	104	66-128	0	30
Ethylbenzene	N.D.	20	21.83	20	22.39	109	112	78-120	3	30
n-Hexane	N.D.	20	22.07	20	22.15	110	111	62-144	0	30
Isopropylbenzene	N.D.	20	21.73	20	22.5	109	112	80-120	3	30
Methyl Tertiary Butyl Ether	5.79	20	25.19	20	26.04	97	101	75-120	3	30
Naphthalene	N.D.	20	18.81	20	19.33	94	97	59-120	3	30
Toluene	N.D.	20	21.19	20	21.69	106	108	80-120	2	30

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Quality Control Summary

Client Name: Stantec
Reported: 11/07/2016 11:20

Group Number: 1720858

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc ug/l	MS Spike Added ug/l	MS Conc ug/l	MSD Spike Added ug/l	MSD Conc ug/l	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max
1,2,4-Trimethylbenzene	N.D.	20	21.69	20	21.95	108	110	75-120	1	30
1,3,5-Trimethylbenzene	N.D.	20	22.53	20	22.29	113	111	75-120	1	30
Xylene (Total)	N.D.	60	67.84	60	68.99	113	115	80-120	2	30
	mg/kg	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**					
Batch number: 16294SLB026	Sample number(s): 8642787-8642788 UNSPK: 8642787									
Acenaphthene	0.558	1.67	2.17	1.64	2.28	97	105	83-116	5	30
Anthracene	0.493	1.67	1.86	1.64	2.03	82	94	82-118	9	30
Benzo(a)anthracene	0.502	1.67	1.85	1.64	2.13	81	99	76-119	14	30
Benzo(a)pyrene	0.332	1.67	1.67	1.64	1.94	81*	98	85-117	15	30
Benzo(b)fluoranthene	0.176	1.67	1.57	1.64	1.59	83	86	79-121	2	30
Benzo(g,h,i)perylene	0.602	1.67	1.94	1.64	2.48	81	114	71-123	24	30
Benzo(k)fluoranthene	0.0309	1.67	1.42	1.64	1.46	83	87	79-120	3	30
1,1'-Biphenyl	N.D.	1.67	1.45	1.64	1.53	87	93	78-106	6	30
Di-n-butylphthalate	N.D.	1.67	1.48	1.64	1.51	89	92	84-120	2	30
Chrysene	0.991	1.67	2.04	1.64	2.44	63*	88	80-121	18	30
Dibenz(a,h)anthracene	N.D.	1.67	1.72	1.64	1.78	103	109	81-123	4	30
Diethylphthalate	N.D.	1.67	1.55	1.64	1.52	93	92	81-118	2	30
2,4-Dimethylphenol	N.D.	1.67	1.25	1.64	1.21	75	73	73-117	3	30
2,4-Dinitrophenol	N.D.	3.33	1.76	3.28	1.67	53	51	16-132	5	30
bis(2-Ethylhexyl)phthalate	0.811	1.67	2.03	1.64	2.31	73*	91	81-121	13	30
Fluoranthene	0.252	1.67	1.79	1.64	1.97	92	104	81-117	9	30
Fluorene	0.954	1.67	2.17	1.64	2.53	73*	96	86-118	15	30
Indeno(1,2,3-cd)pyrene	N.D.	1.67	1.66	1.64	1.75	100	107	75-118	5	30
2-Methylnaphthalene	10.66	1.67	9.07	1.64	11.65	-94 (2)	61 (2)	83-109	25	30
2-Methylphenol	N.D.	1.67	1.40	1.64	1.49	84	91	80-133	6	30
4-Methylphenol	N.D.	1.67	1.43	1.64	1.49	86	91	73-125	4	30
4-Nitrophenol	N.D.	1.67	2.49	1.64	3.59	149*	219*	52-133	36*	30
Phenanthrene	2.68	1.67	3.29	1.64	4.43	36*	107	80-120	30	30
Phenol	N.D.	1.67	1.41	1.64	1.49	85	90	73-122	5	30
Pyrene	1.09	1.67	2.08	1.64	2.51	59*	86	80-120	19	30
Pyridine	N.D.	1.67	N.D.	1.64	N.D.	0*	0*	55-109	0	30
Quinoline	N.D.	1.67	1.52	1.64	1.56	91	95	80-119	3	30
	mg/kg	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**					
Batch number: 162940002A	Sample number(s): 8642787-8642788 UNSPK: 8642787									
Ethylene dibromide	N.D.	0.00441	0.00368	0.00450	0.00333	83	74	60-140	10	20
	mg/kg	**mg/kg**	**mg/kg**	**mg/kg**	**mg/kg**					
Batch number: 162925708005	Sample number(s): 8642787-8642788 UNSPK: P647441									
Cobalt	3.40	45.87	43.36	38.17	35.39	87	84	75-125	20	20
Lead	4.65	13.76	15.59	11.45	13.85	79	80	75-125	12	20
Nickel	11.09	45.87	46.7	38.17	37.27	78	69*	75-125	22*	20
Vanadium	10.59	45.87	55.91	38.17	47.01	99	95	75-125	17	20
Zinc	51.97	45.87	86.55	38.17	63.46	75	30*	75-125	31*	20

*- Outside of specification
(1) The result for one or both determinations was less than five times the LOQ.
(2) The unspiked result was more than four times the spike added.
P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Stantec
Reported: 11/07/2016 11:20

Group Number: 1720858

MS/MSD (continued)

Unspiked (UNSPK) = the sample used in conjunction with the matrix spike

Analysis Name	Unspiked Conc mg/kg	MS Spike Added mg/kg	MS Conc mg/kg	MSD Spike Added mg/kg	MSD Conc mg/kg	MS %Rec	MSD %Rec	MS/MSD Limits	RPD	RPD Max

Laboratory Duplicate

Background (BKG) = the sample used in conjunction with the duplicate

Analysis Name	BKG Conc mg/kg	DUP Conc mg/kg	DUP RPD	DUP RPD Max
Batch number: 162925708005	Sample number(s): 8642787-8642788 BKG: P647441			
Cobalt	3.40	2.42	33*	20
Lead	4.65	4.07	13 (1)	20
Nickel	11.09	6.46	53*	20
Vanadium	10.59	9.88	7	20
Zinc	51.97	33.02	45*	20
	%	%		
Batch number: 16293820007B	Sample number(s): 8642787-8642788 BKG: P642480			
Moisture	18.78	18.84	0	5

Surrogate Quality Control

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

Analysis Name: Evergreen Comprehensive VOCs
Batch number: N162931AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8642789	115	108	95	86
Blank	111	108	96	87
LCS	101	103	98	101
MS	105	104	99	100
MSD	103	106	98	100
Limits:	80-116	77-113	80-113	78-113

Analysis Name: Evergreen Comprehensive VOCs
Batch number: Q162941AA

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
8642787	78	84	80	83
8642788	87	91	90	92
Blank	104	104	106	110

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P###### is indicative of a Background or Unspiked sample that is batch matrix QC and was not performed using a sample from this submission group.

Quality Control Summary

Client Name: Stantec
Reported: 11/07/2016 11:20

Group Number: 1720858

Surrogate Quality Control (continued)

Surrogate recoveries which are outside of the QC window are confirmed
unless attributed to dilution or otherwise noted on the Analysis Report.

	Dibromofluoromethane	1,2-Dichloroethane-d4	Toluene-d8	4-Bromofluorobenzene
LCS	87	90	84	94
LCSD	90	84	92	94
Limits:	50-141	54-135	52-141	50-131

Analysis Name: Skinner 8270 (microwave)
Batch number: 16294SLB026

	Phenol-d6	2-Fluorophenol	2,4,6-Tribromophenol	Nitrobenzene-d5	2-Fluorobiphenyl	Terphenyl-d14
8642787	80	82	89	94	85	95
8642788	83	81	95	159*	96	102
Blank	92	95	105	93	93	100
LCS	96	99	106	96	97	100
MS	79	80	96	96	87	92
MSD	84	86	97	96	91	96
Limits:	58-122	57-126	28-141	54-123	63-117	49-129

Analysis Name: EPA 8011 Solids
Batch number: 162940002A

	1,1,2,2-Tetrachloroethane
8642787	126
8642788	150*
Blank	91
LCS	69
LCSD	69
MS	118
MSD	104
Limits:	60-140

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Environmental Analysis Request/Chain of Custody

eurofins | Lancaster Laboratories Environmental

For Eurofins Lancaster Laboratories Environmental use only

Acct. # 16657 Group # 720858 Sample # 8642787-89

COC # 512558

Client Information

Client: Stantec	Acct. #:
Project Name/#: 213402428	PWSID #:
Project Manager: Jennifer Menges	P.O. #:
Sampler: Dane Hopkins	Quote #:
State where samples were collected: PA	For Compliance: Yes ☐ No ☐

Matrix

Soil ☒ Sediment ☐ Tissue ☐ | Water: Potable ☐ Ground ☐ NPDES ☐ Surface ☐ | Other: Trip Blank

Analysis Requested

Preservation Codes

Eurofins Comprehensive List (Soil) | EDB Soil

Sample Identification	Collected Date	Collected Time	Grab	Composite	Soil	Sediment	Tissue	Potable	Ground	NPDES	Surface	Other	Total # of Containers	Eurofins Comprehensive List (Soil)	EDB Soil
MH8-30(1.5-2.0)	10/4/16	0850	X		X								2	X	X
MH8-31(1.5-2.0)	"	0920	X		X								2	X	X
TRIP BLANK	10/6/16	—										X	2	X	X

For Lab Use Only

FSC:

SCR#: 195619

Preservation Codes

H=HCl T=Thiosulfate
N=HNO_3 B=NaOH
S=H_2SO_4 O=Other

Remarks

Turnaround Time (TAT) Requested (please circle)

Standard Rush

(Rush TAT is subject to laboratory approval and surcharge.)

Date results are needed: 5-day TAT

E-mail address: Jennifer.Menges@Stantec.com

Data Package Options (circle if required)

Type I (EPA Level 3 Equivalent/non-CLP) | Type VI (Raw Data Only)

Type III (Reduced non-CLP) | NJ DKQP | TX TRRP-13

NYSDEC Category A or B | MA MCP | CT RCP

Relinquished by	Date	Time	Received by	Date	Time
Bottle Storage	10.7.16	9:20		10.7.16	9:20
	10.7.16	1200		10/7/16	1200
	10-14-16	1705		10-14-16	1705
	10.14.16	1835			
				10-14-16	1835

EDD Required? Yes No

If yes, format:

Site-Specific QC (MS/MSD/Dup)? Yes No

(If yes, indicate QC sample and submit triplicate sample volume.)

Relinquished by Commercial Carrier:

UPS _____ FedEx _____ Other _____

Temperature upon receipt 1.6 °C

eurofins | Lancaster Laboratories Environmental

Sample Administration Receipt Documentation Log

Doc Log ID: 165346

Group Number(s): 1720858

Client: Stantec

Delivery and Receipt Information

Delivery Method:	ELLE Courier	Arrival Timestamp:	10/14/2016 18:35
Number of Packages:	1	Number of Projects:	1
State/Province of Origin:	PA		

Arrival Condition Summary

Shipping Container Sealed:	No	Sample IDs on COC match Containers:	Yes
Custody Seal Present:	No	Sample Date/Times match COC:	Yes
Samples Chilled:	Yes	VOA Vial Headspace ≥ 6mm:	N/A
Paperwork Enclosed:	Yes	Total Trip Blank Qty:	2
Samples Intact:	Yes	Trip Blank Type:	HCl
Missing Samples:	No	Air Quality Samples Present:	No
Extra Samples:	No		
Discrepancy in Container Qty on COC:	No		

Unpacked by Cory Jeremiah (10469) at 19:38 on 10/14/2016

Samples Chilled Details

Thermometer Types: *DT = Digital (Temp. Bottle)* *IR = Infrared (Surface Temp)* *All Temperatures in °C.*

Cooler #	Thermometer ID	Corrected Temp	Therm. Type	Ice Type	Ice Present?	Ice Container	Elevated Temp?
1	DT146	1.6	DT	Wet	Y	Bagged	N

2425 New Holland Pike
Lancaster, PA 17605-2425

T | 717-656-2300
F | 717-656-2681
www.LancasterLabs.com

Explanation of Symbols and Abbreviations

The following defines common symbols and abbreviations used in reporting technical data:

BMQL	Below Minimum Quantitation Level	**mg**	milligram(s)
C	degrees Celsius	**mL**	milliliter(s)
cfu	colony forming units	**MPN**	Most Probable Number
CP Units	cobalt-chloroplatinate units	**N.D.**	none detected
F	degrees Fahrenheit	**ng**	nanogram(s)
g	gram(s)	**NTU**	nephelometric turbidity units
IU	International Units	**pg/L**	picogram/liter
kg	kilogram(s)	**RL**	Reporting Limit
L	liter(s)	**TNTC**	Too Numerous To Count
lb.	pound(s)	**µg**	microgram(s)
m3	cubic meter(s)	**µL**	microliter(s)
meq	milliequivalents	**umhos/cm**	micromhos/cm

< less than

> greater than

ppm parts per million - One ppm is equivalent to one milligram per kilogram (mg/kg) or one gram per million grams. For aqueous liquids, ppm is usually taken to be equivalent to milligrams per liter (mg/l), because one liter of water has a weight very close to a kilogram. For gases or vapors, one ppm is equivalent to one microliter per liter of gas.

ppb parts per billion

Dry weight basis Results printed under this heading have been adjusted for moisture content. This increases the analyte weight concentration to approximate the value present in a similar sample without moisture. All other results are reported on an as-received basis.

Laboratory Data Qualifiers:

B - Analyte detected in the blank
C - Result confirmed by reanalysis
E - Concentration exceeds the calibration range
J (or G, I, X) - estimated value ≥ the Method Detection Limit (MDL or DL) and < the Limit of Quantitation (LOQ or RL)
P - Concentration difference between the primary and confirmation column >40%. The lower result is reported.
U - Analyte was not detected at the value indicated
V - Concentration difference between the primary and confirmation column >100%. The reporting limit is raised due to this disparity and evident interference…
W - The dissolved oxygen uptake for the unseeded blank is greater than 0.20 mg/L.

Additional Organic and Inorganic CLP qualifiers may be used with Form 1 reports as defined by the CLP methods.
Qualifiers specific to Dioxin/Furans and PCB Congeners are detailed on the individual Analysis Report.

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Measurement uncertainty values, as applicable, are available upon request.

Tests results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff.

Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as “analyze immediately” are not performed within 15 minutes.

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